Fast Flux Test Facility

The Fast Flux Test Facility (FFTF) is a U.S. Government-owned, 400 megawatt-thermal, sodium-cooled reactor located on the Hanford Site near Richland, Washington. This facility has been used in the past for advanced nuclear testing in fuels, materials, components, and reactor safety, as well as for the production of a large number of different isotopes needed for medical and industrial research. As one of the outstanding U.S. research facilities, it also attracted international research work.

Following ten years of highly successful operation, the FFTF was shut down in 1992 because U.S. nuclear R&D requirements were projected to decrease and other reactor facilities - such as the EBR-II in Idaho and the Advanced Neutron Source – were projected to be available. The FFTF was defueled and systems required solely for reactor power operations were deactivated. Sodium coolant and systems required for safe standby operation have remained in operation. System integrity and configuration control have been maintained. Since 1992, however, projected civilian R&D needs have increased beyond the capacity of existing and projected nuclear facilities. Presently, DOE does not have sufficient neutron sources to meet its projected irradiation needs for medical isotope production, plutonium-238 production for future space exploration missions, and nuclear research and development.

Fast Flux Test Facility

Radioisotope Production

Isotope Target Assembly Being Readied for Irradiation in FFTF

The FFTF is ideal for production of radio-isotopes to meet the projected dramatic growth in the radio-pharmaceutical market. Neutron energy tailoring allows production of high specific activity and quality radioisotopes - permits realization of new medical applications such as monoclonal antibody cancer treatment.

In light of these growing research needs, irreversible deactivation operations at the FFTF were suspended in 1997, at the direction of the Secretary of Energy. Consequently, the facility is being maintained in a standby status that would permit it to remain available to support potential future missions, and trained personnel needed to support future activities associated with restart or deactivation of the FFTF remain on staff. In 1999, after careful consideration of the recommendations from the Nuclear Energy Research Advisory Committee and other Department analyses, the Secretary decided that the FFTF could possibly serve a unique and valuable science and research role as a part of the Department's national nuclear technology infrastructure. To meet expanded civilian research and development needs over the next 35 years, the Department is preparing a programmatic environmental impact statement (PEIS) that will consider enhancements to DOE's existing nuclear research facility infrastructure, including the potential role of FFTF. This PEIS is expected to be completed in fiscal year 2001, along with cost, nonproliferation, and R&D planning documents. Collectively these will inform the Department's decision expected that same year on whether to restart the FFTF or permanently shut it down.

The FFTF reactor can provide a number of irradiation services simultaneously. Its Open Test Assembly locations enable production of short-lived radioisotopes. Other in-reactor irradiation vehicles support production of longer lived

isotopes. The large number of neutrons FFTF can produce over a wide range of energy levels at steady-state conditions, coupled with the use of local flux moderation techniques, permit the flux spectrum in an individual target assembly to be optimized for a specific purpose with minimal impacts on the overall core flux. This diversity allows for flexibility in material production as well as target irradiation scheduling, and makes it possible for FFTF to support a number of potential missions, including: plutonium-238 production for space power applications; medical isotope production; neutron irradiation services for fusion and advanced fission; space reactor applications; and cooperative international research.

The FFTF will remain in its safe standby condition until a decision on its future use is made, after which either restart or deactivation activities will proceed as funding permits. Prior to the Department decision, based on available funding, certain activities necessary to both restart and deactivation (e.g., fuel handling control system upgrades and personnel training and qualification) will be undertaken.

FY 2000 Accomplishments

- Maintain facility in a safe and environmentally compliant condition pending a decision on its future use.

FY 2001 Accomplishments

- Maintain facility in a safe and environmentally compliant condition pending a decision on its future use, and prepare for either restart or deactivation by implementing control upgrades for fuel handling systems, expanding equipment surveillance and maintenance, and supporting PEIS and ROD development.

- If decision is to restart FFTF: further expand equipment surveillance and maintenance; complete planning for system restoration, initiate conceptual design development for equipment upgrades and isotope production systems.

- If decision is to deactivate FFTF: make preparations to drain FFTF sodium coolant; procure reactor vessel drain pump; acquire and qualify staff needed to support fuel off-load and sodium drain.

Program Budget
FFTF
($ in Millions)

FY 1999 Appropriation	FY 2000 Appropriation	FY 2001 Request
$30.0[a]	$28.0[b]	$44.010

[a] *Excludes $9.2 million of prior year balances reprogrammed into this account in FY 1998.*

[b] *Excludes needed reprogramming to maintain the facility in full compliance with applicable Federal and State health, safety, and environmental regulations, and to conduct a National Environmental Policy Act review to evaluate the Department.*